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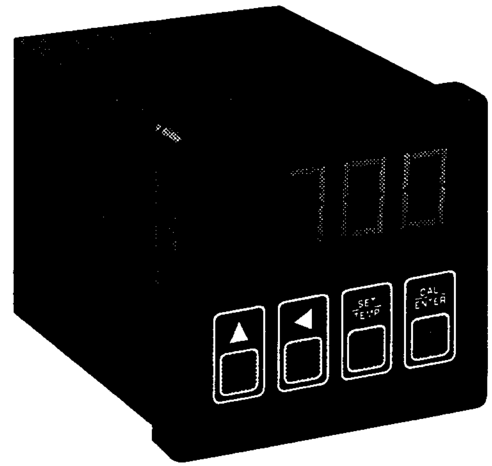
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M1811/0694

PHCN-410
pH Controller



OMEGA® An OMEGA Technologies Company

Operator's Manual

OMEGA

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RETURN REQUESTS / INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA ENGINEERING Customer Service Department. Call toll free in the USA and Canada: 1-800-622-2378, FAX: 203-359-7811; International: 203-359-1660, FAX: 203-359-7807.

BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, YOU MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OUR CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. P.O. number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems you are having with the product.

FOR **NON-WARRANTY** REPAIRS OR **CALIBRATION**, consult OMEGA for current repair/calibration charges. Have the following information available BEFORE contacting OMEGA:

1. P.O. number to cover the COST of the of the repair/calibration,
2. Model and serial number of product, and
3. Repair instructions and/or specific problems you are having with the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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pH Controller Operator's Manual

Section 4 Operating the Controller

Section 5 Specifications

1 Getting Started

1.1 Unpacking the Controller

Remove the Packing List and verify that you have received all equipment. If you have questions about the shipment, please call the OMEGA Customer Service Department at 1-800-622-2378 or (203) 359-1660.

Upon receipt of shipment, inspect the container and equipment for any signs of damage. Note any evidence of rough handling in transit. Immediately report any damage to the shipping agent.

NOTE

The carrier will not honor any claims unless all shipping material is saved for their examination. After examining and removing contents, save packing material in the event reshipment is necessary.

1.2 Controller Description

The OMEGA® PHCN-410 pH controller is a microprocessor-based pH controller with automatic temperature compensation, a 4-digit LED display, two SPDT mechanical relays, and a fixed 4-20 mA output.

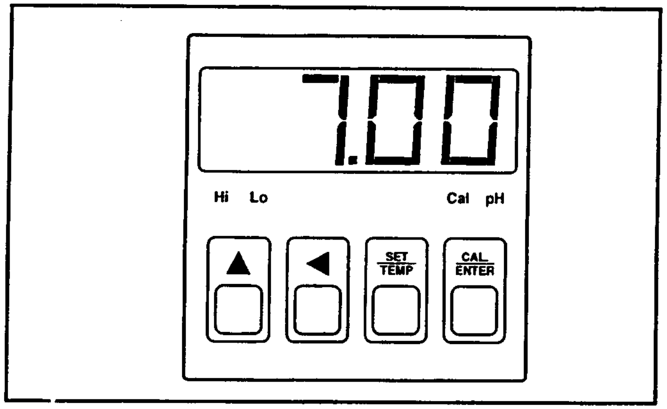


Figure 1-1. Front Panel Display

1.3 Keypad Description

The PHCN-410 features four keys for entering all set-up parameters and performing calibration. (Refer to Figure 1-1).

Use This Key:	To:
SET/TEMP	Select setpoint relay modes (Lo and Hi)
CAL/ENTER	Initiate calibration procedure using standard pH buffers 7.00, 4.01 or 10.01 to enter selected setpoint values
◀	Select numerical position from right to left
▲	Select number from 0-9

1.4 Front Panel Displays

This Display:	Indicates:
pH	Controller in pH mode
CAL	pH calibration mode; display shows 7.00, 4.01, and 10.01; CAL annunciator off when calibration complete
Hi	High alarm relay activated
Lo	Low alarm relay activated

1.5 General Information

We recommend that you bench-test all equipment prior to installation. This requires wiring the equipment and checking relay and output functions as well as pH input (see section 2.2). This is also a good time to initially calibrate the pH electrode to the meter (see section 3).

2 Installing the Controller

2.1 Mounting the Controller

Refer to Figures 2-1 and 2-2 for panel cutout and meter dimensions.

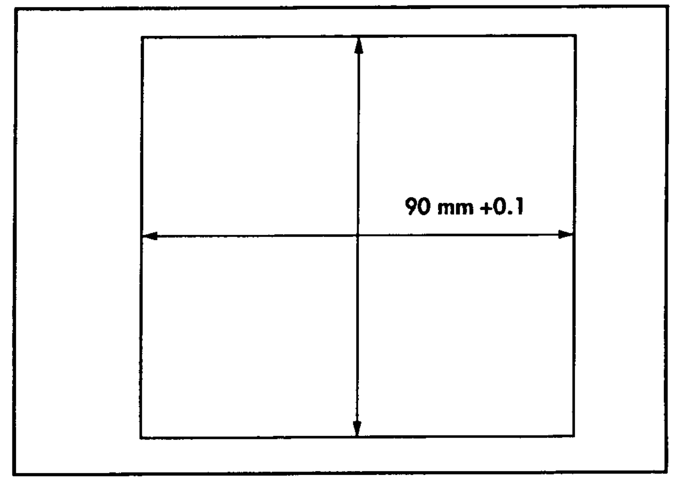


Figure 2-1. Panel Cutout Dimensions

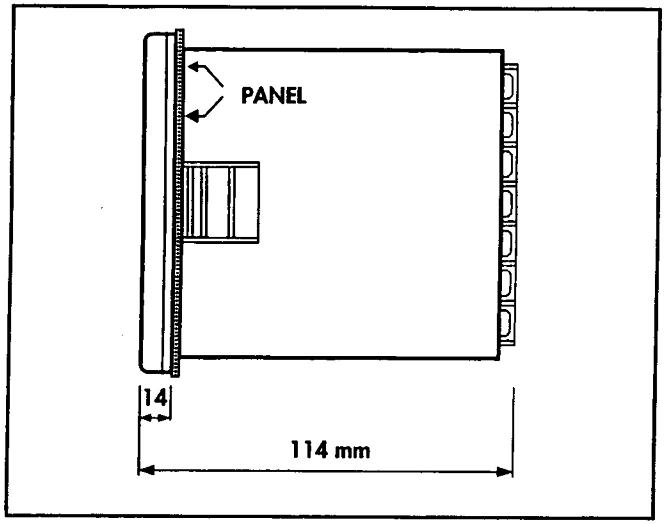


Figure 2-2. Meter Dimensions

2.2 Wiring the Controller

2.2.1 Connect ac Power

Connect ac power to the proper terminals (refer to Figure 2-3). "D3" is hot, "D2" is neutral, and "D1" is ground. For 220 Vac operation, "D4" is hot, "D2" is neutral, and "D1" is ground.

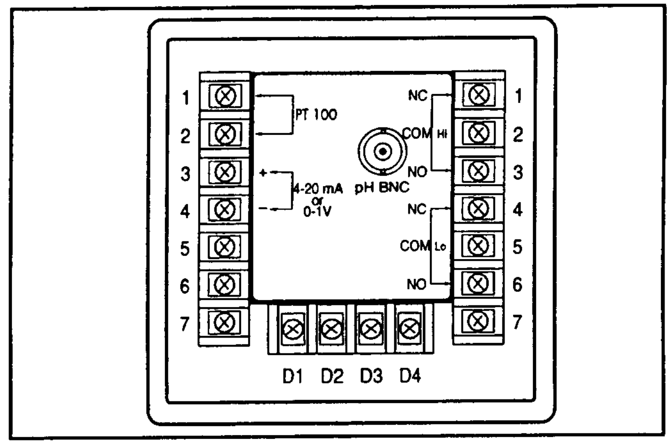


Figure 2-3. Rear Panel Connections

2.2.2 Making Input Connections

1. Connect the pH combination electrode to the BNC connector on the back of the unit.

2. If using Automatic Temperature Compensation (ATC), connect the 100 ohm Pt RTD leads of the temperature probe to Terminals 1 and 2 (no polarity - see Figure 2-3).

   The 100 ohm Pt RTD temperature probe can be separate from the pH electrode, built into the body of the pH electrode or (in selected models) built into the mounting assembly of the pH electrode.

If an ATC input is not provided to the meter, the temperature reading will default to 25°C. If the process temperature is constant, but not 25°C, a precision resistor can be used to simulate the appropriate temperature value to the unit. For example, if the control process runs at 0°C, a resistor with a value of 100 ohms can be wired to Terminals 1 and 2. The temperature display will show approximately 0°C. For a complete temperature versus resistance table, consult the OMEGA Temperature Measurement Handbook and Encyclopedia®.

NOTE

The PHCN-410 features Automatic Temperature Compensation; however, the temperature value is not displayed.

2.2.3 Making Output Connections

For Hi and Lo Setpoint Relays:

Connect the proper load to the NO and COM terminals or the NC and COM terminals.

When the load is connected to the NO and COM, the relay is open until the setpoint is reached. When the load is connected to the NC and COM, the relay is closed until the setpoint is reached. The wiring configuration is application dependent.

The PHCN-410 has a fixed 4-20 mA output.

Notes

3 Calibrating the pH Electrode

3.1 Calibrating the pH Electrode

Calibration of the electrode to the pH meter is essential for accurate pH measurement. It is also necessary to recalibrate the electrode periodically. The frequency of recalibration is system dependent.

The pH calibration procedure is as follows:

1. Connect the combination pH electrode and temperature compensation probe (if using ATC) to the meter (refer to Figure 2-3).
2. Apply power to the instrument.
3. Remove the electrode protector from the end of the pH electrode; rinse the electrode with distilled water, and place it in standard pH buffer 7.00 solution. Press the CAL key.

   At this time the "CAL" annunciator light will appear. When the light goes off, the first point is calibrated. If "7-E" appears in the display, this means the pH buffer 7.00 was not used or the pH electrode has failed.

4. Remove the pH electrode from the pH buffer 7.00. Rinse the electrode with distilled water and place the electrode in standard pH buffer 4.01 or 10.01. Press the CAL Key.

   At this time the "CAL" annunciator light will appear. When the light goes off, the slope is calibrated.

4 Operating the Controller

4.1 Entering PHCN-410 Hi/Lo Setpoints

4.1.1 To Enter the Hi Setpoint Value:

1. Press the SET/TEMP keypad, until the Hi annunciator is lit on the front panel.
2. Use the ◀ and ▲ keys to change the displayed value to the desired value.
3. When the desired value is showing in the display, press the CAL/ENTER keypad to store this value into memory.

4.1.2 To Enter the Lo Setpoint Value:

1. Press the SET/TEMP keypad, until the Lo annunciator is lit on the front panel.
2. Use the ◀ and ▲ keys to change the displayed value to the desired value.
3. When the desired value is showing in the display, press the CAL/ENTER keypad to store this value into memory.

4.2 Error Messages

7-E - The calibration standard 7.00 pH was not used or the pH electrode has failed.

--E - The pH/mV value is over range.

5 Specifications

Range:	0.00 to 14.00 pH
pH Resolution:	0.01 pH
Accuracy:	±0.01 pH
Temperature:	0.0 to 100.0°C, Automatic or Manual
Display:	pH 0.80" LED 4 Digit Display
Control:	Two Mechanical Relays
Contact:	Two 12 Amp 120 Vac SPDT Mechanical Relays for High and Lo Setpoints
Temperature Compensation:	100 Ohm Pt RTD for ATC or Manual
Operating Temperature:	41 to 122°F (5 to 50°C)
Power:	110/220 Vac, 50/60 Hz
Dimensions:	1/4 DIN
Weight:	1.98 lbs. (0.9 Kg)

Notes

Notes